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ABSTRACT

The question of whether improvements in assessment data for students referred to special education would result in the increased use of these data and a better basis for teaching decisions was studied. Six versions of an assessment report were prepared for a hypothetical child: four with increasing detail and information, one with an integrated description of the same information, and one giving another version of the complete report. Eighty teachers working with learning disabled children were asked to study one of the reports and answer a questionnaire on teaching decisions for reading, spelling, and arithmetic, and other pedagogical techniques. A one-way analysis of variance was performed on the data. Teachers presented with minimum information did not make as many decisions as did those given a full diagnostic report, but different versions of the complete report did not cause a difference in the number of decisions made. Teachers make a number of decisions, but must follow a fairly fixed education offering. This may limit decision making because the need for information for a student is limited by the alternatives the teacher uses. (SLD)

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DIAGNOSTIC REPORTS AS BASIS FOR DECISIONS ON TEACHING

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ABSTRACT

Students referred to special education, complete entrance tests, yielding data potentially useful to their (new) teachers. Research shows that teachers only make sparse use of these data.
The objective of this study is to investigate if improvements in the assessment data, available to teachers, result in an increased use of these data by teachers. We therefore developed different versions of a diagnostic report for a (not existing) student and asked teachers to make 35 decisions on teaching the presented student. Results show that changing the diagnostic report does not influence the teachers' decision making. Yet the number of decisions teachers make is surprisingly high. This might be caused by the fact that teachers work with a fairly fixed educational offering for their students.

S.J. Pijl

1. INTRODUCTION

Students experiencing difficulties in regular education get some additional assistence and attention, a few hours of remedial teaching or are held back a grade. If learning and/or behavioral problems cannot be solved or reduced to tolerable levels the student can be referred to special education.

The school for special education, that the student has been referred to, subjects him/her to an entrance test which is compulsory by law. This test gives information on family background, medical data and psycho-educational assessment data. Results establish whether the student meets the criteria for admission. If so, he/she is admitted to the school for special education, if not the student is referred back to regular education (see for an overview: Meijer, Pijl and Rispens, 1986).

The data gathered during the entrance test are considered a powerful basis of information on the child for the special education teacher. A basis to decide on instructional goals, short term objectives, strategies, methodes, materials etc. Yet several research studies (Pijl and Rispens, 1982; McCann and Semmel, 1983; Ysseldyke, 1983) show that special education teachers only make sparse use of the available assessment data on the newly admitted student. Somehow the available assessment data do not make much impact on decisions on teaching. There are two likely explanations for teachers not using the available assessment data: 1. assessment data normally provided are hard to translate into decisions on goals, objectives, methodes etc. and 2. teachers are not interested in detailed and precise information on new students gathered by others.

In this paper we go into the first given explanation in greater detail: are assessment data hard to translate into educational decisions?

Research on the second explanation is published elsewhere (Pijl & Foster, 1986), but will be summarized in our discussion about the use of assessment data.

2. IMPROVEMENTS IN DIAGNOSING LEARNING PROBLEMS

2.1. Usefulness of diagnostic data

In the assessment process diagnostic information about the referred pupil is gathered by a team of specialists. The usefulness of the diagnostic information for decisions on teaching is subject to repeated debate. Much of the criticism of the diagnosis of learning problems is focused on the limited use for educational decision making. This criticism is often accompanied by the presentation of an improvement in diagnosing learning problems. These improvements cover practically all aspects of the assessment process e.g.: new theories on learning and learning problems, more reliable and valid devices, an integrated presentation of the data in the diagnostic report, an other training of diagnosticians, a more structured assessment process and more controlled judgment and decision making.

Some of the factors considered important in respect to the usefulness of the data are directly reflected in the pupils written report. Other theories on learning and learning problems introduce other concepts, terminology and suggestions for teaching in the report, an other presentation of the data is noticed directly and a more structured assessment process with formulation of hypothesis, testing the hypothesis and building an "N=1 theory" about the pupil is also reflected in the report.

It takes more effort to deduce from the written report if e.g. better devices, an other training or a more controlled judgment and decision making were used. Since most teachers base their educational decisions and planning for a newly admitted pupil on the data from the written report (Pijl & Rispens, 1982) we will focus here on the improvements in theories, the presentation and the assessment process.

2.2. Improvements in theories

Diagnostic information about a newly admitted pupil consists mainly of psycho-educational assessment data. According to research (Ysseldyke,

1983; Pijl & Rispens, 1982) there are a large number of diagnostic devices available for conducting assessment and a variety of instruments are in fact used by diagnosticians. These devices are based on different theoretical notions on learning and learning problems. Besides the devices based on a theory about learning and learning problems there is in use a wide variety of achievement evaluation instruments. The main question here is whether or not accurate decisions on the educational offering can be based on information gathered with these kinds of instruments and - more specificly - if any differences in educational usefulness between the data based on the different notions exist. We briefly note the different theoretical notions important in the assessment of learning problems.

Assessment to produce intelligence data started with Binet. Since that time various theoretical views on intelligence have been developed and IQ tests made. Many intelligence tests are validated against school success criteria or against other intelligence tests (predictive vs concurrent validity). The predictive validity of IQ tests is fairly reasonable (up to .50-.60), but validation is typically aimed at products of learning and not at ways of learning or ways of teaching (Glaser, 1972). Low scores on IQ or on specific factors within the IQ tell you what to expect from learning. It does not tell you how to improve or change teaching (Mearig, 1981).

The development of more-factor tests (like the WISC) gave way to an analysis of the IQ profile. Dips in the profile were seen as a backwardness in development. This resulted in what has been called the 'ability training approach.'

The basic idea in ability training is that problems in learning are caused by an insufficient or incorrect development of certain abilities. Diagnosis is aimed at identifying these abilities in order to start remediation.

It is presumed that training of abilities will result in the disappearance of the problems and reversal of backwardness. Another focus in the ability training is not to train the weak abilities but to make full profit in teaching of the strong ones. This distinction is known as remediation vs compensation.

For a number of years ability training has dominated Special Education both in Europe and the United States (e.g. the work of Frostig; Kephart; Getman; Kirk, McCarty & Kirk, etc.). Over years criticism of ability training has arisen. In publications of Ysseldyke (1973), Ysseldyke and Salvia (1974), Ewing and Brecht (1977), Arter and Jenkins (1979) and Rispens (1977), serious criticism has been expressed over the assumptions. Assumptions about the existence of the abilities, their relevance to learning, the reliable and valid measurement of the abilities, the remediation possibilities and the consequences for teaching.

Especially to overcome the last criticism (concerning the consequences for education) much research has been done on Aptitude-Treatment-Interaction. Although some results are encouraging, the bulk of the ATI research has been disappointing (Cronbach and Snow, 1969).

Ability training is often compared to task analysis (Quay, 1973) and attempts have been made to combine the two (Smead, 1977). In this approach there is no direct interest in or attention to the causes of learning problems and backwardness. In task analysis a skill (like: telling time) is divided into smaller skills (like: knowing the difference between hour and minute hand and knowing the figures). These skills are presumed to be prerequisite for the final skill (telling time). Diagnosis is aimed at finding out which of the prerequisite skills are not yet mastered. Training of the not yet mastered prerequisite skills is sufficient to master the final skill. Criticism of task analysis has been mild (Ysseldyke and Salvia, 1974). Partly because as yet not to much research has been conducted on task analysis. Questions have arisen on how to perform a correct task analysis (do you realy need to know the figures for telling time?) and on the reliability of the tests used. Task analysis as a basis for assessment of learning disabled pupils is promising, because the results are easier to translate into decisions on teaching. Task analysis is centered around skills that are important in education. As yet we lack sufficient data on how efficient task analysis is in remediating learning problems. A serious problem is that task analysis

requires a large time investment before it is operational. That is the reason for its slow implementation in education. As a spin off of task analysis criterion referenced tests have been developed. These are available in fairly many content areas in education.

Recently a shift in learning disabilities research has been made toward cognitive information processing (Neisser, 1976). In this approach the pupil is seen as an active learner; a learner who knows how to handle a problem, how to organize information, what strategy to use, etc. Learning disabled children have strategy defects and are not structural restricted in capacities or abilities. This view on learning disabilities is so new, that the state of the art is better described as 'experimental phase' than 'ready to implement in education.'

Research by Ysseldyke (1983) and Pijl and Rispens (1982) shows, that assessment practice today is dominated by devices based on theories on intelligence, ability training and criterion referenced tests. Available for further use in assessment are a large number of (often norm referenced) achievement tests for evaluation in education.

It is clear from the foregoing that results from these instruments are usually difficult to translate into decisions on teaching. Criterion referenced tests seem to be on the whole the most useful, while the norm referenced tests are useful in decisions on instruction levels (e.g. grade placement).

2.3. The presentation of diagnostic reports

Information from psychological assessment typically is conveyed to teachers through psychological reports. Teachers' comprehension of psychological reports and teachers' use of the data for decisions on the educational offering is reported as being low (Yeh, 1978; Lyman, 1980; Bagnato, 1981). A number of studies has examined the effects on both comprehension and use of different methods of reporting diagnostic results to teachers. Bagnato (1980, 1981) and Wiener (1985) found that it is possible to increase significantly teachers' comprehension and the usefulness of the information. Especially - the

organization of the report, - an integrated presentation in text and not in short statements, - the avoidance of jargon, - the use of examples and - providing detailed suggestions for instruction has been shown to be effective.

2.4. The assessment process

In the literature the way diagnosticians work is described in a number of processmodels. In these models, often diagrammed as flow charts, a stepwise description of the activities and their relative position is given. The way the flow chart is made, reflects a position on assessment as a process.

Van Strien (1975) distinguishes three current positions: 1. assessment as the application in practice of a theory about e.g. learning problems, 2. assessment conducted as a scientific prediction and 3. assessment as a regulative cycle.

The application notion is based on the idea that diagnoses are in fact deductions from a well developed, thoroughly validated theory. With the often complex pupil problems in the field of learning problems there is no way to deduce a diagnosis from such a theory. In paragraph 2.2. above, we showed that the state of affairs in developing and testing theories about learning problems does not allow these kinds of deductions for practical use.

Assessment as a scientific prediction tries to guarantee the quality of the assessment process by following the same procedure as in testing scientific theories and/or hypothesis. A stepwise procedure through the phases observation, induction, deduction, testing and evaluation is used to accept or reject a hypotheses or a set of hypothesis.

A fundamental problem here is, that this procedure leads to a tested explanatory theory and only indirectly to educational decisions. Having a tested theory, explanating of a child's behavior, the diagnostician still has to base his suggestions for action in education on experience and intuition. He this way builds his own practical theory which includes both explanation and action. The

problem is that mistakes, prejudices etc. easily enter the diagnostic process (Rispens, 1983; Van Strien, 1984). Van Striens' (1984, 1986) suggestion is to submit the diagnostian to a rigorous methodological and theoretical discipline.

It has taken shape in the regulative cycle. Phases are: - formulation of the childs' problem, -advancing a diagnosis, - posing a plan, - activating the plan and - evaluation of results. The methodological requirement involves the use of good instruments and a careful reporting and the theoretical requirement has to do with the use of the available theoretical knowledge in formulating the diagnosis and in posing the plan.

From this brief discussion it is clear that only the regulative cycle involves the construction and evaluation of a plan within the diagnostic process while at the same time next to theoretically based knowledge, intuition and experience are used in a justifiable way.

3. TEACHERS' NEED FOR INFORMATION

The extent to which teachers use the available information about a newly admitted student depends in part on their need for information in this situation. Teachers' need for information is defined by the decisions on teaching teachers have to make. To make these decisions information is needed not only on the new student but also on the other pupils in class, the available materials, space, program, resources etc. Teachers integrate and (if necessary) reduce all of these data to a manageable amount and then make decisions.

Shavelson (1983) developed a model which includes the factors contributing to the forming of a judgment and to decisions on teaching. It becomes clear from the model that student information leads to the forming of a judgment, which is in turn the basis for a decision.

Teachers especially in special education do have a lot of information on their students. As a result of restrictions in the amount of data they can handle, teachers tend to reduce the overload of information. They integrate the available information into a limited number of judgments about students (Borko et. al., 1979).

Leach (1976/1977) and Borko & Cadwell (1982) showed that teachers differ in the types of judgments used to describe students. Teachers differ in types of judgments, even when provided with strictly identical information about a student (Cooper, 1977). Despite the differences attempts have been made to describe the types of judgments teachers make.

Shavelson and Stern (1981) found that teachers construct judgments about achievement, classroom behavior, social skills, independence, work habits and self concept. Kleber (1978) gives as the types of judgments: work habits, dominance, social withdrawness, social behavior and talents. Leach (1976/1977) reports as judgment categories: vividness, behavior, studiousness, naivety, stability, responsibility, talents and social background. Kleiter (1973) conducted a secondary analysis of nine research studies and concluded that four types of judgments exists: talents, work habits, social dominance and personality. Hofer (1969) concludes from his research that teachers judge their students on five bipolar dimensions: disciplined vs not disciplined, mentally slow vs mentally fast, modest vs assertive, open vs closed and sensible vs insensible.

Teachers' judgments on students together with information on the nature of the instructional task and the institutional constraints, are input in deciding on teaching. By making decisions on teaching in the preactive phase of teaching, teachers in fact develop a plan. Planning lastly is any activity of teachers concerned with preparing a framework for guiding future action (Hill, Yinger & Robins, 1983). In special education such plans are known as Individual Education Programs (Bateman & Herr, 1981). To make such a plan the teacher has to decide on goals, objectives, teaching methods and materials, evaluation ways, means and dates, etc. Day by day actions in teaching are in principle deductions from the IEP. Evaluation data on student achievement are used as feedback to the plan and lead eventually to its revision.

From research on teacher thinking and teacher planning we know that teachers do not seem typically to work that way. Teachers do not plan by stating goals and objectives and then explicitly chosing methods

and materials to match these (Clark & Yinger, 1979). Teacher planning is dominated by chosing actions (Shavelson, 1983). In daily practice teachers keep the action going in classrooms and that - the action - is their angle of incidence. Action is working with learning contents and materials in a certain order and a certain speed (Shavelson & Stern, 1981). These actions will lead to a goal. Teachers do not think of goals as concrete future pupil behavior or acquired skills, but of global indications of where activities might lead. With global goals evaluation loses its specifiable criteria. Teachers by and large do not focus interest on long term evaluation of pupil achievement gains. They evaluate teaching more in terms of - pupil interest, - involvement and - being active (Hill, Yinger & Robins, 1983). Their first concern is 'in having a succesful day,' not in reaching long terms goals for their pupils (Huberman, 1983).

Planning has to do with choosing actions. How actions are formed is as yet unknown. It is supposed that in the training of teachers and by years of experience a repertoire of actions is formed. The question here is how many alternative actions teachers have in a given situation. Brophy (1982) says that teachers depend on the structure of the teaching methods and the manual that goes with it, which means that they do not have many alternative actions. Morrissey and Semmel (1975) presumed that teachers do have some alternatives (3 to 4). It is suggested that these alternatives do not deviate much from each other (Peterson & Clark, 1978). This lack of alternatives could explain in part why making different individual plans is so difficult for teachers.

One more remark should be made here about teacher planning. Teachers assemble groups of pupils in the classroom (Shavelson & Borko, 1979). A common criterion in forming groups is achievement level. Once the group has been formed, it is the group (and not the individual) that becomes the planning unit (Huberman, 1983; Shavelson, 1983). Planning education may be thought of as being on an individual basis, but execution of the plan is certainly not individual. That in turn makes it understandable that teachers like to make group plans and then assign a newly admitted pupil to one of the groups (Blaauboer

& Pijl, 1986). The group plan becomes the pupil's educational plan. It is of course easier and more efficient to make different group plans and to assign pupils to the groups than it is to make individual plans and try to combine the individual plans to a couple of groups with rather close plans within each group. This preference for group-plans and group-instruction may subvert establishing plans most suitable for any individual child. As Thies and Unrein (1981) stated: planning involves finding a balance between the needs of the child and the convenience of the institution and teacher.

4. RESEARCH QUESTION

Our research is based on the assumption that better diagnostic information will provide teachers with a better basis for making decisions on teaching. Our research question is: will versions of diagnostic reports, differing in potential use, lead to a different number of decisions made?

5. METHOD

The several improvements in diagnosing learning problems, presented in paragraph 2, were given concrete form in a number of different diagnostic reports. Based on the proposed improvements we developed six versions of a diagnostic report for a hypothetical student. The student, called Erik, is 7 years, 9 months old, is shy, withdrawn, has a strong feer of failure, has reading problems, a lack of concentration and his full range IQ is reported as being 82.

The first version functions as a base line: it consists of only a 15 line reason for referral. The second version is based on intelligence and ability data, while the third version gives some intelligence and ability data and detailed information from a task analysis. The fourth version is identical to the third, but provides the teacher with additional data on cognitive information processing. These four versions consist of a presentation of the test results followed by a short summary and conclusion. The construction of these

versions was guided by the theoretical developments, as described in paragraph 2.2.

The fifth version gives the same information as the fourth version, but is presented as an integrated description (in text) of the student's behavior and problems (according to paragraph 2.3.).

The sixth and last version is centered around an "N=1 theory" about this particular student. From the report it becomes clear that the diagnostician worked as much as possible according to the regulative cycle (see paragraph 2.4.). As much as possible, because the essence of the regulative cycle is that the phases action and evaluation are integrated elements in a cyclic diagnostic process. It is not possible to simulate adequately an action phase, conducted by the teacher, on paper. The six developed versions of a diagnostic report on the same pupil are expected to have an arrangement from low (version 1) to high (version 6) in potential usefulness.

Eighty teachers, working in schools for LD children, were asked to study one of these diagnostic reports very carefully and then fill in a questionnaire. The questionnaire consists of 26 decisions on teaching the presented student. The decisions concern teaching reading, spelling and arithmethic and also include a number of decisions concerning the more pedagogical aspects.

Seven decisions on teaching were presented: - on what level of functioning are you going to start?, - in which (sub-)group do you intend to place the new student?, - which reading method are you going to use?, - do you need any additional (e.g. remedial) materials?, - are you planning to develop, change or borrow materials for this particular student?, - how will you teach this student? (think of: size of tasks, independence, ways of instruction, type and amount of exercise) and - what teaching tasks are you likely to delegate to e.g. a remedial teacher or a teacher trainee?

The same seven questions were presented in the spelling and in the arithmetic parts of the questionnaire.

The last five questions have to do with the more pedagogical aspects within teaching. Questions were asked about - observing the

student, - grouping according to behavior, - influencing concentration, motivation and pace, - influencing social-emotional functioning and - changing the child's social behavior with regard to other students and teachers.

Teachers could answer the questions by choosing between: 1. I don't know as yet. I need more information, 2. I know what to do, namely ... or 3. This question does not apply to my situation. We asked the teachers to make each of the 26 decisions and inform us about them. If for a particular decision teachers felt a lack of information about the student, they could choose not to make the decision.

The questionnaire ends with a few questions about the ecological validity of the presented diagnostic report, e.g. - does Erik differ from the pupils in your group and - is the presented diagnostic report comparable to the reports you normally receive?

Respondents were assigned at random to one of the six conditions of the independent variable (a version of the diagnostic report). The dependent variable is the proportion of the decisions made of the total number of possible decisions (that is without: 'does not apply in my situation').

In order to evaluate the use of different versions for making decisions, a one way analysis of variance was performed on the data, supplemented with Helmert-contrasts.

6. RESULTS

Table 1 presents the results of the analysis of variance and table 2 some descriptive data.

Table 1: Analysis of variance

Source	DF	SS	MS	F	F
Between versions	5	1.08	.26	6.87	< .0001
Within versions	67	2.11	.03		
Total	72	3.19			

Table 2: Descriptive statistics

Version	N	Mean	ST DEV
1	12	.40	.27
2	10	.72	.21
3	13	.76	.09
4	13	.63	.15
5	15	.75	.15
6	10	.67	.16
Total	.73	.66	.21

The analysis of variance shows (see table 1) that the percentage of decisions made by teachers differs between the several versions. Although table 2 gives an impression of the cause for this effect, we generated some Helmert contrasts to explore the relationship further.

Table 3: Helmert contrasts

Sources	DF	SS	MS	F	Sign of F
Within versions	67	2.11	.03		
Version 1	1	.91	.91	28.91	<.0001
Version 2-6	4	.15	.04	1.20	.32

With the first Helmert contrast we compared the use (percentage decisions made) of version 1 with the overall use of the versions 2, 3, 4, 5 and 6. The F-ratio is: F=28.91, which is significant (α=5%). With the next Helmert contrast we checked if the percentage of decisions differed between the version 2 to 6. The F-ratio is: F=1.20, which is not significant at α=5%.

DISCUSSION

If teachers are presented with an absolute minimum of information (as in version 1 with a 15 line reason for referral), they will not make as many decisions as when presented with a full diagnostic report.

However, different versions of such a diagnostic report do not lead to a difference in number of decisions made. So, not all kinds of suggestions to change or to improve the diagnosis of learning problems lead to an increased use by teachers. That holds for changes in the theoretical basis for the diagnosis, for changes in the presentation of the report and for changes in the assessment process.

In research on learning problems it is presumed that e.g. assessment based on task analysis is much more valuable to teachers then data produced by the ability training approach and intelligence data (see 2.2.). Bagnato (1981) concluded that a translated diagnostic report resulted in more diagnostic-instructional links, while we could not show any significant difference in the number of decisions made (which is another dependent variable!) between the versions concerned. That finally teachers did not react to the changes in the assessment process might be caused by an relative insensitivity to the way diagnostic data are generated, or stated otherwise: the reliability of the data is not a factor.

Still, there is more to say about these data. The percentage of decisions teachers make is surprisingly high (see table 2). Even with a minimum of information teachers made 40% of the decisions and with a full diagnostic report this percentage increased to approximately 70%. How do teachers make 40% of the decisions with practically no information? Either by guessing or by basing the decisions on a fairly fixed educational offering. A fixed offering enables teachers to fill in the questionnaire by using a number of 'defaults' in educational decision making. In that situation teachers did not have to make all the decisions, they just had to write down what their 'normal' educational offering to students like Erik is.

One of the results of our research into the second explanation for teachers not using the available assessment data (see paragraph 1) is, that teachers indeed work with a fairly fixed educational offering for their students (Pijl & Foster, 1986). We concluded there that at least the teaching method and materials, the division in subgroups and the pedagogical grouprules are given and that teachers did not tend to deviate much from this offering (see also: Peterson & Clark, 1978;

Blaauboer & Pijl, 1986). So, parts of our questionnaire could actually be answered by using 'defaults.'

Teachers' immediate need for information on a newly admitted student is therefore limited. The need for information might be restricted to a few global student charateristics important in establishing the fit between the new student and an existing group of students and an existing educational offering.

From this point of view it becomes clear that improvements in the diagnosis of learning problems is no guarantee of better or more intensive use of the information. Teachers may not know what to do with more precise, detailed, subtle information as long as the instructional alternatives are not observed.

The results of this study urge for an other teacher training, whereby teachers are trained to develop and use alternative actions in teaching. Only then student information will make sense to teachers and will be used to decide on appropriate actions. Improving the diagnostic reports alone will not result in an intensified use.

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